NEWSLETTER

I-TECH COMMITTEE

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North Korea Cyber-Attacks a Hacker, He Shuts Down their Whole Internet

A hacker in the US has taken credit for the ongoing internet disruption in North Korea. He states that he is performing "denial-of-service" attacks on the country to get back at the regime for targeting him in cyber-attacks a year earlier.

Fig 1:-Hacker

The story is that of pure revenge, against a previous cyber-attack from North Korea that our protagonist here was the victim of. At the time, a hacking campaign by North Korea had targeted Western security researchers in an attempt to steal their hacking tools and find chinks in their cybersecurity protocols. Among the many targeted, one American took this attack personally and wanted to get back at North Korea's attempts. Identified as P4x in a recent report by Wired, the American hacker waited for a year to see if the US government responded to North Korea's strike. Seeing that there was no retaliation, P4x decided to revert to the attacks by himself. "If they don't see we have teeth, it's just going to keep coming," the hacker told Wired. To get back at North Korea's hacker group, P4x then launched "denial-of-service" attacks on the servers and routers of North Korea's networks. He had found numerous "known but unpatched vulnerabilities" in the systems that allowed him to launch these attacks. Since then, P4x has managed to automate these attacks on the country's networks. Now he just periodically checks the functioning of his programs meant to disrupt the internet of North Korea, right at his home. "It's pretty interesting how easy it was to actually have some effect there," he told Wired.

Microsoft Acquires CloudKnox Security

Helping organizations strengthen cloud security and Zero Trust. At Microsoft, we are committed to supporting organizations in their digital transformation and helping them to deliver secure and seamless experiences. Since IT modernization often spans multiple clouds, cloud security and identity are top of mind for most of our customers. Modern identity security needs to protect all users and resources consistently across multi-cloud and hybrid cloud environments. Today, Microsoft is taking a significant step toward this goal with the acquisition of CloudKnox Security, a leader in Cloud Infrastructure Entitlement Management (CIEM). CloudKnox offers complete visibility into privileged access. It helps organizations right-size permissions and consistently enforce least-privilege principles to reduce risk, and it employs continuous analytics to help prevent security breaches and ensure compliance. This strengthens our comprehensive approach to cloud security. As organizations adapt to hybrid work and more and more cloud services are deployed, new service entities that collaborate and exchange data without human interaction, such as virtual machines and containers, are proliferating. The growth of these service accounts and identities and their increasing volumes of permissions, privileges and entitlements exposes organizations to new attack vectors. Left in blind spots or uncontrolled, these permissions leave business critical systems open to infiltration and disruption. High-profile breaches demonstrate how quickly bad actors can move laterally by exploiting misappropriated privileged credentials. While organizations are reaping the benefits of cloud adoption, they still struggle to assess, prevent, enforce and govern privileged access across hybrid and multi-cloud environments. Even if they piece multiple siloed systems together, they still get an incomplete view of privileged access. Traditional Privileged Access Management and Identity Governance and Administration solutions are well suited for on-premises environments, however they fall short of providing the necessary end-to-end visibility for multi-cloud entitlements and permissions.

Fig 2:- Workspace

NASA's Webb telescope launches to see first galaxies, distant worlds

A joint effort with ESA (European Space Agency) and the Canadian Space Agency, the Webb observatory is NASA's revolutionary flagship mission to seek the light from the first galaxies in the early universe and to explore our own solar system, as well as planets orbiting other stars, called exoplanets. "The James Webb Space Telescope represents the ambition that NASA and our partners maintain to propel us forward into the future," said NASA Administrator Bill Nelson. "The promise of Webb is not what we know we will discover; it's what we don't yet understand or can't yet fathom about our universe. I can't wait to see what it uncovers!" Ground teams began receiving telemetry data from Webb about five minutes after launch. The Arianespace Ariane 5 rocket performed as expected, separating from the observatory 27 minutes into the flight. The observatory was released at an altitude of approximately 75 miles (120 kilometers). Approximately 30 minutes after launch, Webb unfolded its solar array, and mission managers confirmed that the solar array was providing power to the observatory. After solar array deployment, mission operators will establish a communications link with the observatory via the Malindi ground station in Kenya, and ground control at the Space Telescope Science Institute in Baltimore will send the first commands to the spacecraft. Engineers and ground controllers will conduct the first of three mid-course correction burns about 12 hours and 30 minutes after launch, firing Webb's thrusters to maneuver the spacecraft on an optimal trajectory toward its destination in orbit about 1 million miles from Earth. "I want to congratulate the team on this incredible achievement -- Webb's launch marks a significant moment not only for NASA, but for thousands of people worldwide who dedicated their time and talent to this mission over the years," said Thomas Zurbuchen, associate administrator for the Science Mission Directorate at NASA Headquarters in Washington. "Webb's scientific promise is now closer than it ever has been. We are poised on the edge of a truly exciting time of discovery, of things we've never before seen or imagined."The world's largest and most complex space science observatory will now begin six months of commissioning in space. At the end of commissioning, Webb will deliver its first images. Webb carries four

state-of-the-art science instruments with highly sensitive infrared detectors of unprecedented resolution. Webb will study infrared light from celestial objects with much greater clarity than ever before. The premier mission is the scientific successor to NASA's iconic Hubble and Spitzer space telescopes, built to complement and further the scientific discoveries of these and other missions. "The launch of the Webb Space Telescope is a pivotal moment -- this is just the beginning for the Webb mission," said Gregory L. Robinson, Webb's program director at NASA Headquarters. "Now we will watch Webb's highly anticipated and critical 29 days on the edge. When the spacecraft unfurls in space, Webb will undergo the most difficult and complex deployment sequence ever attempted in space. Once commissioning is complete, we will see awe-inspiring images that will capture our imagination." The telescope's revolutionary technology will explore every phase of cosmic history -- from within our solar system to the most distant observable galaxies in the early universe, to everything in between. Webb will reveal new and unexpected discoveries and help humanity understand the origins of the universe and our place in it. NASA Headquarters oversees the mission for the agency's Science Mission Directorate. NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages Webb for the agency and oversees work on the mission performed by the Space Telescope Science Institute, Northrop Grumman, and other mission partners. In addition to Goddard, several NASA centers contributed to the project, including the agency's Johnson Space Center in Houston, Jet Propulsion Laboratory in Southern California, Marshall Space Flight Center in Huntsville, Alabama, Ames Research Center in California's Silicon Valley, and others.

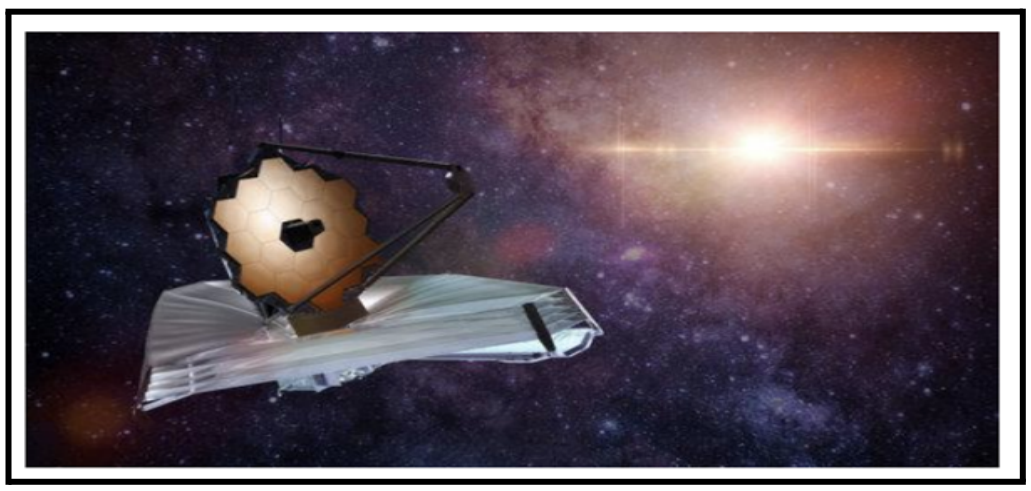

Fig 3:-Captured photo from Telescope

Top 9 Emerging Technology Trends

1. Artificial Intelligence (AI) and Machine Learning (ML)

2. Internet of Things (IoT)

3. Cybersecurity

4. Quantum Computing (QC)

5. Robotic Process Automation (RPA)

6. Virtual Reality (VR) and Augmented Reality (AR)

7. Edge Computing

8. 5G

9. Blockchain

Worlds of pure re-imagination:Meet Me in the Metaverse

Fig 4:-Metaverse

The next wave of digital change is here, providing forward-looking companies.with an opportunity to act today to be ready for the future.Welcome to the Metaverse Continuum—a spectrum of digitally enhanced worlds, realities and business models poised to revolutionize life and enterprise in the next decade. It applies to all aspects of business, from consumer to worker and across the enterprise; from reality to virtual and back; from 2D to 3D; and from cloud and artificial intelligence to extended reality, blockchain, digital twins, edge technologies and beyond. As the next evolution of the internet, the metaverse will be a continuum of rapidly emerging capabilities, use cases, technologies and experiences.The Metaverse Continuum will transform how businesses interact with customers, how work is done, what products and services companies offer, how they make and distribute them, and how they operate their organizations.

Quantum Computing

Quantum computing is an area of computer science that uses the principles of quantum theory. Quantum theory explains the behavior of energy and material on the atomic and subatomic levels.Quantum computing uses subatomic particles, such as electrons or photons. Quantum bits, or qubits, allow these particles to exist in more than one state (i.e., 1 and 0) at the same time.

- Quantum computing uses phenomena in quantum physics to create new ways of computing.
- Quantum computing involves qubits.
- Unlike a normal computer bit, which can be either 0 or 1, a qubit can exist in a multidimensional state.
- The power of quantum computers grows exponentially with more qubits.
- Classical computers that add more bits can increase power only linearly.

Some potential benefits of the same are:-

- Financial institutions may be able to use quantum computing to design more effective and efficient investment portfolios for retail and institutional clients. They could focus on creating better trading simulators and improve fraud detection.
- The healthcare industry could use quantum computing to develop new drugs and genetically-targeted medical care. It could also power more advanced DNA research.
- For stronger online security, quantum computing can help design better data encryption and ways to use light signals to detect intruders in the system.
- Quantum computing can be used to design more efficient, safer aircraft and traffic planning systems.

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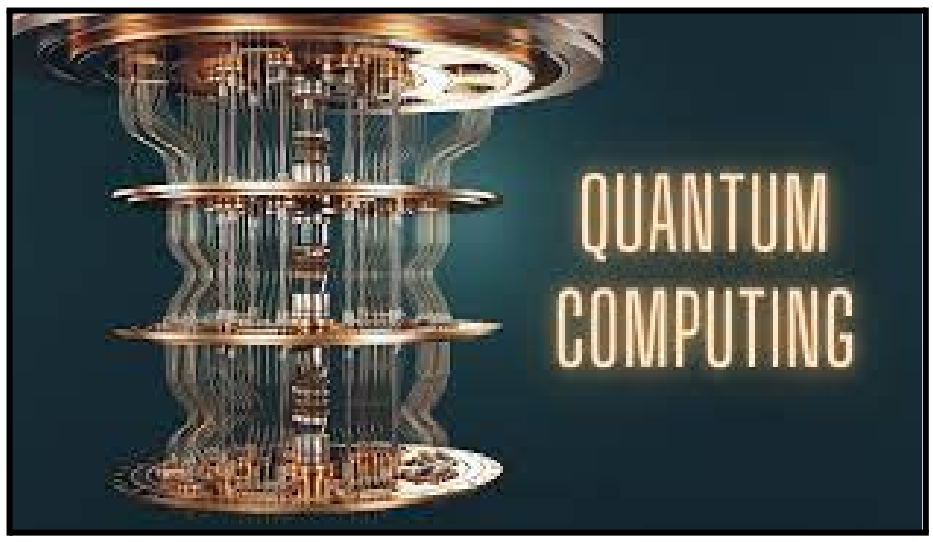

Fig 5:-Quantum computing

Big Data and Analytics

Each day, your customers generate an abundance of data. Every time they open your email, use your mobile app, tag you on social media, walk into your store, make an online purchase, talk to a customer service representative, or ask a virtual assistant about you, those technologies collect and process that data for your organization. And that's just your customers. Each day, employees, supply chains, marketing efforts, finance teams, and more generate an abundance of data, too. Big data is an extremely large volume of data and datasets that come in diverse forms and from multiple sources.This field continues to evolve as data engineers look for ways to integrate the vast amounts of complex information created by sensors, networks, transactions, smart devices, web usage, and more. Even now, big data analytics methods are being used with emerging technologies, like machine learning, to discover and scale more complex insights.

How big data analytics works

1.Data professionals **collect** data from a variety of different sources.

2. Data is prepared and **processed**.

3.Data is **cleansed** to improve its quality.

4.The collected, processed and cleaned data is **analyzed** with analytics software.

Fig 6:-What Big Data complies of

No Sweat: Superhydrophobic Biosensor Reads Your Body's Invisible Signals

A new superhydrophobic biosensor enables the monitoring of "insensible" sweat (vaporized water loss from the skin), which was previously hard to measure. This sensor can be integrated into wearable tech for continuous tracking, aiding in assessing body thermoregulation, skin health, disease conditions, nervous system activity, and detection of other health biomarkers.

Sweat contains biomarkers that help doctors make health diagnoses. Wearable sensors can be used to monitor a person's perspiration rate and provide information about the skin, nervous system activity, and underlying health conditions. But not all sweat is created equal, and some cannot be measured with current sensors. A newly developed superhydrophobic biosensor could be used as a diagnostic tool to detect such types of sweat.The sensor, developed by Huanyu "Larry" Cheng, James L. Henderson, Jr. Memorial Associate Professor of Engineering Science and Mechanics, was featured in a paper published in the journal *ACS Nano*.Sensible, or liquid, perspiration is sweat that can be perceived by a person, such as during intensive exercise. Wearable sensors can provide continuous, non-invasive tracking of this type of sweat. Insensible, or vapor, perspiration is different. It is the loss of only water from the skin, secreted at a much smaller rate during low-intensity exercise or rest, and measuring it is difficult, according to Cheng.

"Monitoring insensible sweat is of high interest for evaluating skin health and disease conditions, such as eczema and wound healing, as well as underlying health statuses, such as pain or anxiety," Cheng said. "Skin-interfaced devices that detect sweat rate and loss are currently limited to working with sensible sweat and are not suitable for insensible sweat in a vapor state."

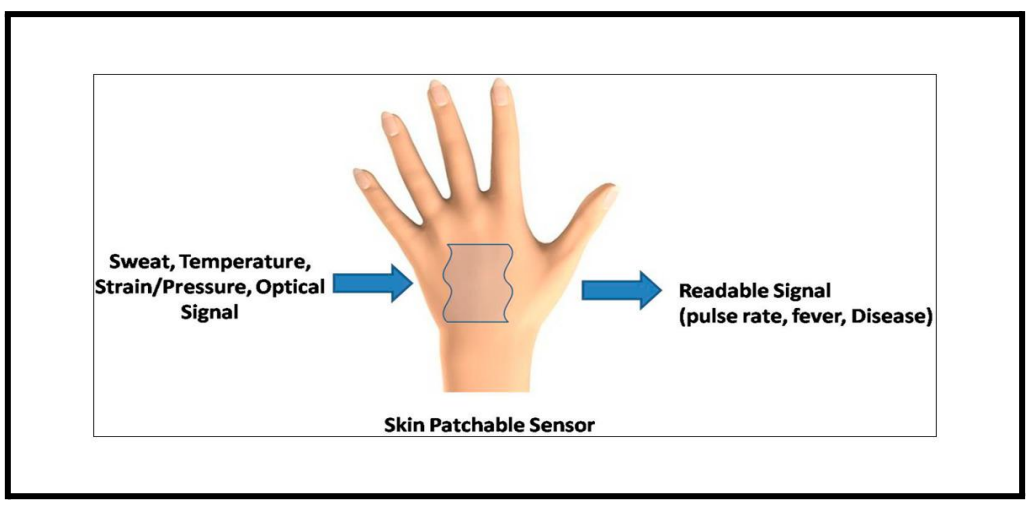

Fig 7:-How the sensor works

Inspired by Brain Cells: Scientists Develop Novel Computer Components

Despite the advancements in technology, the human brain remains superior to computers in several ways. While computers can perform mathematical calculations faster than humans, the human brain is capable of processing complex sensory information and adapting to new experiences with ease. This ability is still beyond the reach of computers, and the human brain accomplishes this feat while consuming only a fraction of the energy required by a laptop.

The structure of the brain contributes significantly to its energy efficiency. Unlike computers, where memory and processing are separate entities and

information needs to be transferred between them, the neurons and synapses in the brain are capable of both storing and processing information simultaneously. This eliminates the need for data to be constantly transported, which can cause slowdowns in computers when handling large amounts of information.One possible solution to this bottleneck is novel computer architectures that are modeled on the human brain. To this end, scientists are developing so-called memristors: components that, like brain cells, combine data storage and processing.

A team of researchers from the Swiss Federal Laboratories for Materials Science and Technology (Empa), ETH Zurich, and the "Politecnico di Milano" has now developed a memristor that is more powerful and easier to manufacture than its predecessors. The researchers have recently published their results in the journal Science Advances.

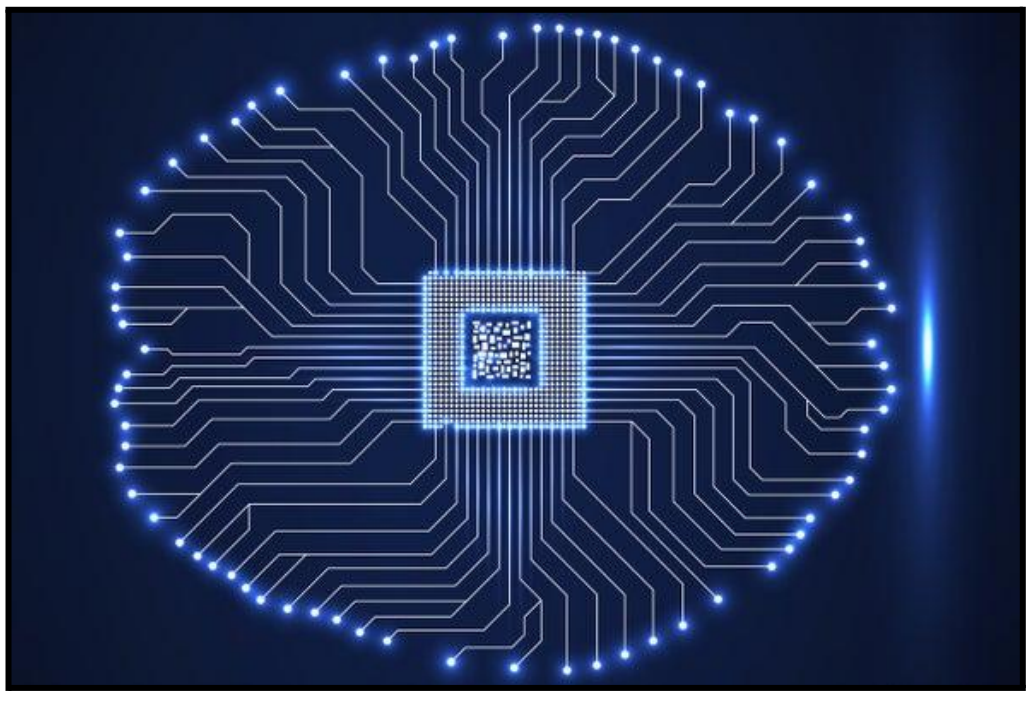

Fig 8:-Novel Component

Performance through mixed ionic and electronic conductivity. The novel memristors are based on halide perovskite nanocrystals, a semiconductor material known from solar cell manufacturing. "Halide perovskites conduct both ions and electrons," explains Rohit John, former ETH Fellow and postdoctoral researcher at both ETH Zurich and Empa. "This dual conductivity enables more complex calculations that closely resemble processes in the brain."

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